APPLICATION FOR FEDERAL ASSISTANCE
SF 424 (R&R)

3. DATE RECEIVED BY STATE	**State Application Identifier**
	NEW YORK

1. TYPE OF SUBMISSION

☐ Pre-application   ☒ Application   ☐ Changed/Corrected Application

4. a. Federal Identifier

b. Agency Routing Identifier

2. DATE SUBMITTED

11/18/2020

Applicant Identifier

c. Previous Grants.gov Tracking ID

5. APPLICANT INFORMATION

Organizational DUNS: 0794861320000

Legal Name: Graphika, Inc.

Department: Division:

Street1: 401 Lafayette Street

Street2: Suite E6

City: NEW YORK   County / Parish: NEW YORK

State: NY: New York   Province:

Country: USA: UNITED STATES   ZIP / Postal Code: 100037014

Person to be contacted on matters involving this application

Prefix: First Name: (b) (6)   Middle Name:

Last Name: (b) (6)   Suffix:

Position/Title:

Street1: 401 Lafayette Street

Street2: Suite E6

City: NEW YORK   County / Parish:

State: NY: New York   Province:

Country: USA: UNITED STATES   ZIP / Postal Code: 100037014

Phone Number: (b) (6)   Fax Number:

Email: (b) (6)

6. EMPLOYER IDENTIFICATION (EIN) or (TIN): 464386048

7. TYPE OF APPLICANT: R: Small Business

Other (Specify):

Small Business Organization Type   ☐ Women Owned   ☐ Socially and Economically Disadvantaged

8. TYPE OF APPLICATION:

☒ New   ☐ Resubmission   If Revision, mark appropriate box(es).

☐ Renewal   ☐ Continuation   ☐ Revision

☐ A. Increase Award   ☐ B. Decrease Award   ☐ C. Increase Duration   ☐ D. Decrease Duration

☐ E. Other (specify):

Is this application being submitted to other agencies?   Yes ☐   No ☒   What other Agencies?

9. NAME OF FEDERAL AGENCY:

Office of Naval Research

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 12.300

TITLE: Basic and Applied Scientific Research

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

Research on Cross-Platform Detection to Counter Malign Influence

12. PROPOSED PROJECT:

Start Date	Ending Date
12/01/2020	11/30/2022

13. CONGRESSIONAL DISTRICT OF APPLICANT

12

14. PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR CONTACT INFORMATION

Prefix: First Name: (b) (6)   Middle Name:

Last Name: (b) (6)   Suffix:

Position/Title: Director of Graphika Labs

Organization Name: Graphika, Inc.

Department: Division:

Street1: 401 Lafayette Street

Street2: Suite E6

City: NEW YORK   County / Parish: NEW YORK

State: NY: New York   Province:

Country: USA: UNITED STATES   ZIP / Postal Code: 100037014

Phone Number: (b) (6)   Fax Number:

Email: (b) (6)

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15. ESTIMATED PROJECT FUNDING

a. Total Federal Funds Requested	2,999,880.26
b. Total Non-Federal Funds	0.00
c. Total Federal & Non-Federal Funds	2,999,880.26
d. Estimated Program Income	0.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES ☐ THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE:

b. NO ☒ PROGRAM IS NOT COVERED BY E.O. 12372; OR

☐ PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

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17. By signing this application, I certify (1) to the statements contained in the list of certifications* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances * and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious. or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)

☒ I agree

The list of certifications and assurances, or an Internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

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18. SFLLL (Disclosure of Lobbying Activities) or other Explanatory Documentation

[Add Attachment] [Delete Attachment] [View Attachment]

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19. Authorized Representative

Prefix: First Name: (b) (6)   Middle Name:

Last Name: (b) (6)   Suffix:

Position/Title: CONTROLLER

Organization: Graphika, Inc.

Department: Division:

Street1: 401 Lafayette Street

Street2: Suite E6

City: NEW YORK   County / Parish: NY

State: NY: New York   Province:

Country: USA: UNITED STATES   ZIP / Postal Code: 100037014

Phone Number: (b) (6)   Fax Number: 6467863297

Email: (b) (6)

Signature of Authorized Representative   Date Signed

Mary E Groeneman   11/19/2020

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20. Pre-application   [Add Attachment] [Delete Attachment] [View Attachment]

21. Cover Letter Attachment   [Add Attachment] [Delete Attachment] [View Attachment]

RESEARCH & RELATED Senior/Key Person Profile (Expanded)

PROFILE - Project Director/Principal Investigator

Prefix: _____   * First Name: **(b) (6)**   Middle Name: _____

* Last Name: **(b) (6)**   Suffix: _____

Position/Title: Director of Graphika Labs   Department: _____

Organization Name: Graphika, Inc.   Division: _____

* Street1: 401 Lafayette Street

Street2: Suite E6

* City: NEW YORK   County/ Parish: NEW YORK

* State: NY: New York   Province: _____

* Country: USA: UNITED STATES   * Zip / Postal Code: 100037014

* Phone Number: **(b) (6)**   Fax Number: _____

* E-Mail: **(b) (6)**

Credential, e.g., agency login: _____

* **Project Role:** PD/PI   **Other Project Role Category:** _____

Degree Type: _____

Degree Year: _____

*Attach Biographical Sketch   1239-CV - Vladimir Barash.pdf   [Add Attachment] [Delete Attachment] [View Attachment]

Attach Current & Pending Support   _____   [Add Attachment] [Delete Attachment] [View Attachment]

PROFILE - Senior/Key Person 1

Prefix: _____   * First Name: _____   Middle Name: _____

* Last Name: _____   Suffix: _____

Position/Title: _____   Department: _____

Organization Name: _____   Division: _____

* Street1: _____

Street2: _____

* City: _____   County/ Parish: _____

* State: _____   Province: _____

* Country: USA: UNITED STATES   * Zip / Postal Code: _____

* Phone Number: _____   Fax Number: _____

* E-Mail: _____

Credential, e.g., agency login: _____

* **Project Role:** _____   **Other Project Role Category:** _____

Degree Type: _____

Degree Year: _____

Attach Biographical Sketch   _____   [Add Attachment] [Delete Attachment] [View Attachment]

Attach Current & Pending Support   _____   [Add Attachment] [Delete Attachment] [View Attachment]

RESEARCH & RELATED Other Project Information

1. Are Human Subjects Involved? ☐ Yes ☒ No

  1.a.   If YES to Human Subjects

    Is the Project Exempt from Federal regulations? ☐ Yes ☐ No

      If yes, check appropriate exemption number. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

      If no, is the IRB review Pending? ☐ Yes ☐ No

      IRB Approval Date: [_____]

    Human Subject Assurance Number: [_____]

2. Are Vertebrate Animals Used? ☐ Yes ☒ No

  2.a.   If YES to Vertebrate Animals

    Is the IACUC review Pending? ☐ Yes ☐ No

    IACUC Approval Date: [_____]

    Animal Welfare Assurance Number: [_____]

3. Is proprietary/privileged information included in the application? ☒ Yes ☐ No

4.a. Does this Project Have an Actual or Potential Impact - positive or negative - on the environment? ☐ Yes ☒ No

4.b. If yes, please explain: [_____]

4.c. If this project has an actual or potential impact on the environment, has an exemption been authorized or an environmental assessment (EA) or environmental impact statement (EIS) been performed? ☐ Yes ☐ No

4.d. If yes, please explain: [_____]

5. Is the research performance site designated, or eligible to be designated, as a historic place? ☐ Yes ☒ No

5.a. If yes, please explain: [_____]

6. Does this project involve activities outside of the United States or partnerships with international collaborators? ☐ Yes ☒ No

6.a. If yes, identify countries: [_____]

6.b. Optional Explanation: [_____]

7. Project Summary/Abstract [1234-Graphika Project Abstract - 2020] [Add Attachment] [Delete Attachment] [View Attachment]

8. Project Narrative [1235-SOW_Graphika_ONR_Malign_Influenc] [Add Attachment] [Delete Attachment] [View Attachment]

9. Bibliography & References Cited [_____] [Add Attachment] [Delete Attachment] [View Attachment]

10. Facilities & Other Resources [_____] [Add Attachment] [Delete Attachment] [View Attachment]

11. Equipment [_____] [Add Attachment] [Delete Attachment] [View Attachment]

12. Other Attachments [Add Attachments] [Delete Attachments] [View Attachments] ☐

Project Abstract Summary

This Project Abstract Summary form must be submitted or the application will be considered incomplete. Ensure the Project Abstract field succinctly describes the project in plain language that the public can understand and use without the full proposal. Use 4,000 characters or less. Do not include personally identifiable, sensitive or proprietary information. Refer to Agency instructions for any additional Project Abstract field requirements. If the application is funded, your project abstract information (as submitted) will be made available to public websites and/or databases including USAspending.gov.

Funding Opportunity Number

N00014-21-S-B001

CFDA(s)

12.300

Applicant Name

Graphika, Inc.
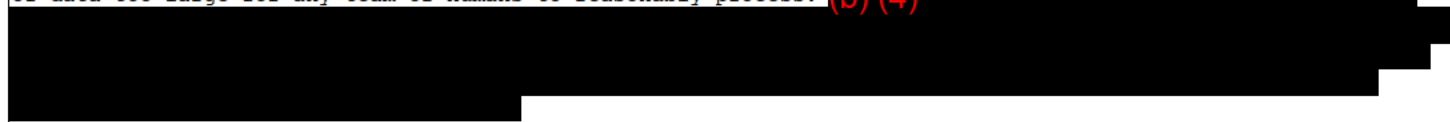
Descriptive Title of Applicant's Project

Research on Cross-Platform Detection to Counter Malign Influence

Project Abstract

The most complicated malign influence campaigns, which are also among the greatest long-term national security threats, are those that move across multiple social platforms. The social media companies themselves have little capability in the area of cross-platform detection and analysis, which is one of the main reasons they partner with Graphika for their own defensive efforts. Each company has exceptional data and intelligence on what is happening on its own platform, but very few state actor campaigns are limited to a single platform where they can be detected and removed (deplatformed) entirely. In fact, as nation states have evolved their online operations, cross-platform networks have become part of the standard tradecraft. Sophisticated campaigns such as those emanating from China, Russia, and Iran typically have nexus on many platforms (see, for example, Graphika's Secondary Infektion investigation). As part of our current threat intelligence solutions, Graphika maps threat actor networks on individual platforms, and then our analysts and investigators manually trace connections as the campaigns move from one platform to another, eventually rolling them up for removal. Currently no technology exists to approach this problem in an automated way at scale.

To combat this threat effectively over the long term, research is needed to determine the feasibility of developing cross-platform capable network mappings and AI-enabled detection algorithms that can analyze volumes of data too large for any team of humans to reasonably process. (b) (4)

ORGANIZATIONAL DUNS: 0794861320000

Enter name of Organization: Graphika, Inc.

Budget Type: ☒ Project ☐ Subaward/Consortium

Budget Period: 1 **Start Date:** 12/01/2020 **End Date:** 11/30/2021

A. Senior/Key Person

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		▮		(b) (4)	2.88			(b) (4)	▮	(b) (4)

Project Role: PD/PI

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		▮		(b) (4)	0.26			(b) (4)	▮	▮

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		▮		(b) (4)	0.26			(b) (4)	▮	▮

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		▮		(b) (4)	0.42			(b) (4)	▮	▮

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		▮		(b) (4)	0.52			(b) (4)	▮	▮

Project Role: ADVISOR/REVIEWER

Additional Senior Key Persons: 1236-GRAPHIKA labor costs 202011   [Add Attachment] [Delete Attachment] [View Attachment]

Total Funds requested for all Senior Key Persons in the attached file (b) (4)

Total Senior/Key Person (b) (4)

B. Other Personnel

Number of Personnel	Project Role	Months Cal.	Months Acad.	Months Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
	Secretarial/Clerical						
1	RESEARCH ENGINEER	4.33			(b) (4)	■	■
1	RESEARCH ENGINEER	4.33			(b) (4)	■	■
1	RESEARCH SCIENTIST	4.33			(b) (4)	■	■
1	RESEARCHER	4.33			(b) (4)	■	■
2	ENGINEERS (DATA ENGINEER AND BACK END ENGINEER)	8.66			(b) (4)	■	■
1	PROJECT MANAGER	2.94			(b) (4)	■	■

7 Total Number Other Personnel

Total Other Personnel: (b) (4)

Total Salary, Wages and Fringe Benefits (A+B) (b) (4)

C. Equipment Description

List items and dollar amount for each item exceeding $5,000

Equipment item | Funds Requested ($)

Additional Equipment: [Add Attachment] [Delete Attachment] [View Attachment]

Total funds requested for all equipment listed in the attached file

Total Equipment

D. Travel

Funds Requested ($)

1. Domestic Travel Costs (Incl. Canada, Mexico and U.S. Possessions)
2. Foreign Travel Costs

Total Travel Cost

E. Participant/Trainee Support Costs

Funds Requested ($)

1. Tuition/Fees/Health Insurance
2. Stipends
3. Travel
4. Subsistence
5. Other

Number of Participants/Trainees

Total Participant/Trainee Support Costs

F. Other Direct Costs

		Funds Requested ($)
1.	Materials and Supplies	
2.	Publication Costs	
3.	Consultant Services	
4.	ADP/Computer Services	
5.	Subawards/Consortium/Contractual Costs	
6.	Equipment or Facility Rental/User Fees	
7.	Alterations and Renovations	
8.	(b) (4)	(b) (4)
9.		
10.		
	Total Other Direct Costs	(b) (4)

G. Direct Costs

	Funds Requested ($)
Total Direct Costs (A thru F)	(b) (4)

H. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
OVERHEAD	(b) (4)	(b) (4)	(b) (4)
		Total Indirect Costs	(b) (4)

Cognizant Federal Agency
(Agency Name, POC Name, and
POC Phone Number)

I. Total Direct and Indirect Costs

	Funds Requested ($)
Total Direct and Indirect Institutional Costs (G + H)	(b) (4)

J. Fee

	Funds Requested ($)

K. Total Costs and Fee

	Funds Requested ($)
Total Costs and Fee (I + J)	(b) (4)

L. Budget Justification

(Only attach one file.) 1238-Graphika Budget Justification.pdf [Add Attachment] [Delete Attachment] [View Attachment]

ORGANIZATIONAL DUNS: 0794861320000   **Enter name of Organization:** Graphika, Inc.

Budget Type: ☒ Project   ☐ Subaward/Consortium

Budget Period: 2   **Start Date:** 12/01/2021   **End Date:** 11/30/2022

A. Senior/Key Person

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		■		(b) (4)	2.94			(b) (4)	■	■

Project Role: PD/PI

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	(b) (6)		■		(b) (4)	0.35			(b) (4)	■	■

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
(b) (6)			■		(b) (4)	0.35			(b) (4)	■	■

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
(b) (6)			■		(b) (4)	0.58			(b) (4)	■	■

Project Role: ADVISOR/REVIEWER

Prefix	First	Middle	Last	Suffix	Base Salary ($)	Cal.	Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
(b) (6)			■		(b) (4)	0.52			(b) (4)	■	■

Project Role: ADVISOR/REVIEWER

Additional Senior Key Persons: 1237-GRAPHIKA labor costs 202011   [Add Attachment] [Delete Attachment] [View Attachment]

Total Funds requested for all Senior Key Persons in the attached file (b) (4)

Total Senior/Key Person (b) (4)

B. Other Personnel

Number of Personnel	Project Role	Cal.	Months Acad.	Sum.	Requested Salary ($)	Fringe Benefits ($)	Funds Requested ($)
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
	Secretarial/Clerical						
1	RESEARCH ENGINEER	4.33			(b) (4)	████	████
1	RESEARCH ENGINEER	4.33			(b) (4)	████	████
1	RESEARCH SCIENTIST	4.33			(b) (4)	████	████
1	RESEARCHER	4.33			(b) (4)	████	████
2	ENGINEERS (DATA ENGINEER AND BACK END ENGINEER)	8.66			(b) (4)	████	████
1	PROJECT MANAGER	2.39			(b) (4)	████	████

| 7 | Total Number Other Personnel | | | | | Total Other Personnel | (b) (4) |

Total Salary, Wages and Fringe Benefits (A+B)   (b) (4)

C. Equipment Description

List items and dollar amount for each item exceeding $5,000

Equipment item	Funds Requested ($)

Additional Equipment: _____ [Add Attachment] [Delete Attachment] [View Attachment]

Total funds requested for all equipment listed in the attached file ____

Total Equipment ____

D. Travel

Funds Requested ($)

1. Domestic Travel Costs (Incl. Canada, Mexico and U.S. Possessions) ____
2. Foreign Travel Costs ____

Total Travel Cost ____

E. Participant/Trainee Support Costs

Funds Requested ($)

1. Tuition/Fees/Health Insurance ____
2. Stipends ____
3. Travel ____
4. Subsistence ____
5. Other ____

Number of Participants/Trainees ____   Total Participant/Trainee Support Costs ____

F. Other Direct Costs

		Funds Requested ($)
1.	Materials and Supplies	
2.	Publication Costs	
3.	Consultant Services	
4.	ADP/Computer Services	
5.	Subawards/Consortium/Contractual Costs	
6.	Equipment or Facility Rental/User Fees	
7.	Alterations and Renovations	
8.	(b) (4)	(b) (4)
9.		
10.		
	Total Other Direct Costs	(b) (4)

G. Direct Costs

	Funds Requested ($)
Total Direct Costs (A thru F)	(b) (4)

H. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
OVERHEAD	(b) (4)	(b) (4)	(b) (4)
		Total Indirect Costs	(b) (4)

Cognizant Federal Agency
(Agency Name, POC Name, and POC Phone Number)

I. Total Direct and Indirect Costs

	Funds Requested ($)
Total Direct and Indirect Institutional Costs (G + H)	1,578,938.60

J. Fee

Funds Requested ($)

K. Total Costs and Fee

	Funds Requested ($)
Total Costs and Fee (I + J)	1,578,938.60

L. Budget Justification

(Only attach one file.) 1238-Graphika Budget Justification.pdf [Add Attachment] [Delete Attachment] [View Attachment]

RESEARCH & RELATED BUDGET - Cumulative Budget

Totals ($)

Section A, Senior/Key Person	(b) (4)
Section B, Other Personnel	(b) (4)
Total Number Other Personnel	14
Total Salary, Wages and Fringe Benefits (A+B)	(b) (4)
Section C, Equipment	
Section D, Travel	
1. Domestic	
2. Foreign	
Section E, Participant/Trainee Support Costs	
1. Tuition/Fees/Health Insurance	
2. Stipends	
3. Travel	
4. Subsistence	
5. Other	
6. Number of Participants/Trainees	
Section F, Other Direct Costs	(b) (4)
1. Materials and Supplies	
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Other 1	(b) (4)
9. Other 2	
10. Other 3	
Section G, Direct Costs (A thru F)	(b) (4)
Section H, Indirect Costs	733,778.60
Section I, Total Direct and Indirect Costs (G + H)	3,149,628.28
Section J, Fee	
Section K, Total Costs and Fee (I + J)	3,149,628.28

N00014-21-S-B001 FY2021 Long Range BAA for Navy and Marine Corps Science and Technology

Opp PKG00263730 12.300 Basic and Applied Scientific Research

Graphika, Inc. Budget Justification

We have used the following procedure in calculating all labor costs:

Current base annual salary, divided by 2,080 (number of labor hours per year).

(b) (4)

Personnel	Base Rate ($/h)	Fringe Benefits (b) (4)	Salary	Y1 hours	Calendar Months	base salary	total fringe	total Y1 cost	O/H 1.85	total w O/H	
SENIOR											
(b) (6)	$ (b) (4)	███	███	500	2.88	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	45	0.26	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	45	0.26	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	72	0.42	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	90	0.52	$ (b) (4)	███	███	███	███	
OTHER											
(b) (6)	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
Data Engineer	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
BE Engineer	$ (b) (4)	███	███	750	4.33	$ (b) (4)	███	███	███	███	
(b) (6)	$ (b) (4)	███	███	510	2.94	$ (b) (4)	███	███	███	███	
								$ (b) (4)	███	███	

Personnel	Base Rate ($/h)	Fringe Benefits (b) (4)	Salary	Y2 hours	Calendar Months	base salary	total fringe	total Y2 cost	O/H 1.85	total w O/H
SENIOR										
▮	$ (b) (4)	▮ ▮	▮ ▮	510	2.94	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	60	0.35	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	60	0.35	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	100	0.58	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	90	0.52	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮
OTHER										
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
Data Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
BE Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	415	2.39	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
								$ (b) (4)	▮ ▮	▮

Personnel	Base Rate ($/h)	Fringe Benefits (b) (4)	Salary	Y1 hours	Calendar Months	base salary	total fringe	total Y1 cost	O/H 1.85	total w O/H	
SENIOR											
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	500	2.88	$ (b) (4)	▮ ▮	▮	▮	▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	45	0.26	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮ ▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	45	0.26	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮ ▮	
(b) (6)	$ (b) (4)	▮ ▮	▮	72	0.42	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	90	0.52	$ (b) (4)	▮ ▮	▮ ▮	▮ ▮	▮	
OTHER											
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
(b) (6) r	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
Data Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
BE Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮	▮	
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	510	2.94	$ (b) (4)	▮ ▮	▮	▮	▮	
								$ (b) (4)	▮	▮	

Personnel	Base Rate ($/h)	Fringe Benefits (b) (4)	Salary	Y2 hours	Calendar Months	base salary	total fringe	total Y2 cost	O/H 1.85	total w O/H
SENIOR										
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	510	2.94	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	60	0.35	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	60	0.35	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	100	0.58	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	90	0.52	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
OTHER										
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
Data Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
BE Engineer	$ (b) (4)	▮ ▮	▮ ▮	750	4.33	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
(b) (6)	$ (b) (4)	▮ ▮	▮ ▮	415	2.39	$ (b) (4)	▮ ▮	▮	▮ ▮	▮
								$ (b) (4)	▮ ▮	▮

Research on Cross-Platform Detection to Counter Malign Influence

Broad Area Announcement (BAA): N00014-21-S-B001

Company: Graphika, Inc.
Business Size: Small Business, <100
CAGE Code: 77CL0
DUNS: 079486132

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 18 November 2020

Background

The most complicated malign influence campaigns, which are also among the greatest long-term national security threats, are those that move across multiple social platforms. The social media companies themselves have little capability in the area of cross-platform detection and analysis, which is one of the main reasons they partner with Graphika for their own defensive efforts. Each company has exceptional data and intelligence on what is happening on its own platform, but very few state actor campaigns are limited to a single platform where they can be detected and removed (deplatformed) entirely. In fact, as nation states have evolved their online operations, cross-platform networks have become part of the standard tradecraft. Sophisticated campaigns such as those emanating from China, Russia, and Iran typically have nexus on many platforms (see, for example, Graphika's Secondary Infektion investigation). As part of our current threat intelligence solutions, Graphika maps threat actor networks on individual platforms, and then our analysts and investigators manually trace connections as the campaigns move from one platform to another, eventually rolling them up for removal. Currently no technology exists to approach this problem in an automated way at scale.

To combat this threat effectively over the long term, research is needed to determine the feasibility of developing cross-platform capable network mappings and AI-enabled detection algorithms that can analyze volumes of data too large for any team of humans to reasonably process. (b) (4)

Scientific Problems and Issues

This effort will be founded on research in communications, network science, information theory, mathematical sociology, and artificial intelligence/machine learning. Research on social media and its effects on the audience is situated in a small number of capabilities, such as natural language processing, artificial intelligence, and machine learning, and similar modeling capabilities, such as LDA, and the tools and techniques of hybrid fields, such as mathematical sociology, network science, and social psychology. These techniques and foundational science have difficulty producing causal reasoning models and forensic measurements that can manage "big social data," due to both the scale of the data and the intrinsic difficulty of detecting causal mechanisms in social systems. Big social data in the form of social media posts is often a compendium of fragmented narratives, fraught with changing social dynamics that occur across highly volatile timelines (such as found in Twitter and Reddit) and more slow-moving but pervasive platforms (Facebook and blogs). Some platforms are new, for example Gab.ai, Parler, and the "pink slime" news agencies that promote conspiracy theory and disinformation. The phenomenon of deplatforming is also new and will impact the growth and reformation of adversarial groups that lose access to mainstream platforms. Scientists and researchers currently have limited capability to study and survey cross-platform shifts in adversarial campaigns in order to develop the necessary algorithms and models to assess changes in the platform "ecology." Platforms are a kind of "habitat," and shifting from platform to platform necessitates changes in recruitment and information maneuvers designed to influence audiences.

In fact, the concept of affordance theory, originally drawn from understanding how organisms interact with their environments (Gibson 1982), has been extended to social media (Bucher and Helmond 2018) and invoked to understand the ways in which "technical protocols enable, constrain, and shape user behavior in a virtual space" (Bossetta 2019). Differing capacities for persistence, replicability, scalability, and searchability on social media platforms (Boyd 2010) can impact the potential visibility of a narrative, lowering or strengthening the potential for success of an influence campaign. Moreover, much of the work that has been done on related topics, including maximizing social influence through social media (Kempe et al. 2003), have been limited to single-platform phenomena (e.g. Aral et al. 2009, Bakshy et al. 2011, Bond et al. 2012), which limits our ability to infer how information and influence campaigns evolve and continue to shape discourse and social dynamics as they move from one network to another either voluntarily or involuntarily (e.g., because some group or topic is banned on a platform). Our work will contribute to the computational social science theories informing these processes and open new lines of inquiry on how information operations grow and change across time and cyberspace.

The building of models and metrics for defining, describing, and evaluating influence campaigns in the effort will utilize current research on social contagion theory (Macy, Cornell) and on information maneuver (Carley and Beskow 2019) to provide a beginning point for the scientific framework for this work. Social science research will be combined with information science research, such as "digital fingerprints" (Chinazzi et al. 2019), to assist in the development of new advanced metrics for threat assessment and new definitions of complex, cross-platform information maneuvers. Machine learning, natural language processing, and statistical studies will be combined with insights and frameworks from social science to develop new algorithms and causal models to detect, track, and analyze influence and threat content across multiple social media and traditional news media platforms.

Graphika's research will provide groundbreaking insights into the strategic landscape of disinformation flows, including both "negative" or "deconstructive" strategies, such as distort, dismiss, dismay, and distract (Nimmo 2015), and "positive" or "constructive" strategies, such as identifying "superspreaders" and "superfriends" (Carley 2019). Our research will not involve direct evaluation of specific counterstrategies or their causal impact on the spread of disinformation – such evaluations will require future, separate projects. At the same time, our research will provide valuable context and information about the causal mechanisms that allow disinformation campaigns to operate successfully, including information on possible strategies for countering cross-platform disinformation.

Management Plan

The Graphika team includes expertise in federal contract and project management. Graphika will assign a project manager (PM) to communicate with the customer stakeholders as needed. The PM will prepare and deliver the monthly progress reports at the start of each month to include:
- A summary of the work performed, including an explanation of changes to the work planned in the previous month;
- Key issues or problems that may affect performance or schedule, along with the proposed corrective actions;
- Technical reports provided to the Government, and when and to whom provided.

Graphika will meet with the customer Program Manager (PM), Contracting Officer (CO), and Contracting Officer's Representative (COR) monthly, or as needed, to present deliverables, discuss progress, and resolve emerging problems. If necessary, Graphika has cleared personnel and is able to support any and all meetings at client spaces. After each meeting, Graphika will submit a meeting report recording all key minutes and subsequent actions within five working days. Graphika will submit each report electronically via email unless the PM, CO, or COR request otherwise.

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Military Relevance

Public affairs, information operations, and military information support operations (MISO) and many other missions rely on understanding the full spectrum of information environments, including digital and social media platforms. The fragmented nature of narratives and the capacity of adversaries to cloak themselves, coordinate, and deploy effective influence campaigns against US military missions has been a significant problem since 2014. The problem is growing and the threat is evolving; the need for a strategic insight into adversarial operations has caused information warfare to become a top priority for US Defense Science and Technology across all services. The US Marine Corps lists information warfare as among their very top priorities; Navy, Army, and Air Force also list information warfare among their top concerns. The capabilities to track adversarial narratives, rumors, and social cyber-attacks has significant limitations in the current technology base but also in the models and strategic understanding of the space necessary to formulate cogent, effective counter-messaging. Across all services, the objective to defeat adversaries and apply significant costs to their operations has emerged as an important requirement. This is difficult to accomplish as adversaries can so effectively cloak their identities, leap from platform to platform, and coordinate operations in ways that are currently hard to detect and measure.

Project Description and Objectives

Graphika will deliver a basic research program focused on prototyping models and algorithms for network mappings that span multiple social media platforms, which can be further enhanced by AI-enabled algorithmic detection models. Graphika will research and subsequently develop a set of machine learning, natural language processing, statistical, and causal models to detect, track, and analyze influence and threat content across multiple social media and traditional news media platforms.

The program will be delivered over the course of 24 months and will focus on the following key research objectives:

1. **Research Objective 1:** Research and develop multi-modal network mappings and perform an assessment on how these mappings can be subsequently leveraged for cross-platform detection of social contagion and coordinated activity to support automated indicators and warnings of malign campaigns.
2. **Research Objective 2:** Create a repository of attributed cross-platform information operation (IO) campaigns to serve as a data source for machine learning and other models to develop digital "fingerprints" of threat actors, and research the feasibility of automated detection and attribution of leads derived from these "fingerprints."
3. **Research Objective 3:** Research and assess the feasibility of developing new metrics to measure the impact of information operation campaigns, including causal mechanisms of the transition of disinformation in cross-platform networks and into offline behavior in the physical world.

At the conclusion of the 24-month program, a productization effort could be undertaken to integrate new technologies resulting from this research and development program into a fully featured software platform that would be deployable for USG customers with the mission of defending the United States against malign influence.

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This objective will focus on three key areas of research and deliverables:

1.1 Building an end-to-end analysis and reporting pipeline to support the development of models and algorithms for improving characterization of threats and assist in attribution of threat actors. This pipeline will include data collection, building a cross-modal network map, identifying and monitoring actors and campaigns, classifying and describing information threats, tracking disinformation dynamics, and detecting and tracing related information and threat phenomena, including novel real-world events – all in the context of how these phenomena move and evolve across different platforms over time.

1.2 Extending dynamic language and network models to incorporate multiple platforms. These models will complete a robust multi-modal mapping of the social media landscape by utilizing natural language processing (NLP) tools. These tools will allow for the remainder of the aforementioned pipeline (Objective 1.1) to collate related information, regardless of platform, for analysis, monitoring, and detailed description of actors and events, which will contribute to experimental assessments and model development

1.3 Study the Feasibility of Automated Multi-Modal Cross-Platform Mapping
Upon completion of 1.1 and 1.2, Graphika will study the feasibility for multi-modal mapping using test data and potential map renderings against non-automated methods to assist in model validation and further experiments in Research Objectives 2 and 3.

2.0 Research Objective 2: Digital IO Fingerprints and Automated Lead Detection
This objective will focus on the research and development of deep-learning models to "fingerprint" the behaviors of threat actors engaging in malign influence (Chinazzi et al. 2019). (b) (4)
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██ This objective will focus on two key areas of research and deliverables:

2.1 Creation of an internal data repository of attributed malign influence campaigns for machine learning training and testing pipelines, with privacy-preserving versions made publicly available for other researchers at the program's conclusion.

2.2 Development of fingerprint models for threat actors and malign behaviors to support automated detection of inbound leads on new malign campaigns, including detection and attribution methods integrating network and language information.

3.0 Research Objective 3: Leveraging Causal Inference to Measure the Impact of Online Campaigns and Identify Signals for Transitions to Offline Behaviors
Once a threat has been detected, its potential impact must be assessed to determine whether mitigation is required and what type of response is warranted. (b) (4)
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████████████████████ We will implement this research in three key areas of research and deliverables:

3.1 Development of models and metrics to measure impact of malign influence campaigns, including how events on one social/news media platform affect users and content on other platforms (Lukito 2019).

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Research on Cross-Platform Detection to Counter Malign Influence

Broad Area Announcement (BAA): N00014-21-S-B001

Company: Graphika, Inc.
Business Size: Small Business, <100
CAGE Code: 77CL0
DUNS: 079486132

Contact:

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18 November 2020

Background

Public affairs, information operations, and military information support operations (MISO) and many other defense and intelligence missions rely on understanding the full spectrum of information environments, including digital and social media platforms. The fragmented nature of narratives and the capacity of adversaries to cloak themselves, coordinate, and deploy effective influence campaigns against US military missions has been a significant problem since 2014. The problem is growing and the threat is evolving; the need for a strategic insight into adversarial operations has caused information warfare to become a top priority for US Defense Science and Technology across all services. The US Marine Corps lists information warfare as among their very top priorities; Navy, Army, and Air Force also list information warfare among their top concerns. The capabilities to track adversarial narratives, rumors, and social cyber-attacks have significant limitations in the current technology base but also in the models and strategic understanding of the space necessary to formulate cogent, effective counter-messaging. Across all services, the objective to defeat adversaries and apply significant costs to their operations has emerged as an important requirement. This is difficult to accomplish as adversaries can so effectively cloak their identities, leap from platform to platform, and coordinate operations in ways that are currently hard to detect and measure.

The most complicated malign influence campaigns, which are also among the greatest long-term national security threats, are those that move across multiple social platforms. The social media companies themselves have little capability in the area of cross-platform detection and analysis, which is one of the main reasons they partner with Graphika for their own defensive efforts. Each company has exceptional data and intelligence on what is happening on its own platform, but very few state actor campaigns are limited to a single platform where they can be detected and removed (deplatformed) entirely. In fact, as nation states have evolved their online operations, cross-platform networks have become part of the standard tradecraft. Sophisticated campaigns such as those emanating from China, Russia, and Iran typically have nexus on many platforms (see, for example, Graphika's Secondary Infektion investigation). As part of our current threat intelligence solutions, Graphika maps threat actor networks on individual platforms, and then our analysts and investigators manually trace connections as the campaigns move from one platform to another, eventually rolling them up for removal. Currently no technology exists to approach this problem in an automated way at scale.

To combat this threat effectively over the long term, fundamental research is needed to determine the feasibility of developing cross-platform capable network mappings and AI-enabled detection algorithms that can analyze volumes of data too large for any team of humans to reasonably process. (b) (4) ████████████████████████████

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Scientific Problems and Issues

This effort will be founded on research in communications, network science, information theory, mathematical sociology, and artificial intelligence/machine learning. Research on social media and its effects on the audience is situated in a small number of capabilities, such as Natural Language Processing, Artificial Intelligence and Machine Learning, and similar modeling capabilities, such as LDA, and the tools and techniques of hybrid fields, such as mathematical sociology, network science, and social psychology. These techniques and foundational science have difficulty producing causal reasoning models and forensic measurements that can manage "big social data," due to both the scale of the data and the intrinsic difficulty of detecting causal mechanisms in social systems. Big social data in the form of social media posts is often a compendium of fragmented narratives, fraught with changing social dynamics that occur across highly volatile timelines (such as found in Twitter and Reddit) and more slow-moving but pervasive platforms (Facebook and blogs). Some platforms are new, for example Gab.ai, Parler, and the "pink slime" news agencies that promote conspiracy theory and disinformation. The phenomenon of deplatforming is also new and will impact the growth and reformation of adversarial groups that lose access to mainstream platforms. Scientists and researchers currently have limited capability to study and survey cross-platform shifts in adversarial campaigns in order to develop the necessary algorithms and models to assess changes in the platform "ecology." Platforms are a kind of "habitat," and shifting from platform to platform necessitates changes in recruitment and information maneuvers designed to influence audiences.

In fact, the concept of affordance theory, originally drawn from understanding how organisms interact with their environments (Gibson 1982), has been extended to social media (Bucher and Helmond 2018) and invoked to understand the ways in which "technical protocols enable, constrain, and shape user behavior in a virtual space" (Bossetta 2019). Differing capacities for persistence, replicability, scalability, and searchability on social media platforms (Boyd 2010) can impact the potential visibility of a narrative, lowering or strengthening the potential for success of an influence campaign. Moreover, much of the work that has been done on related topics, including maximizing social influence through social media (Kempe et al. 2003), have been limited to single-platform phenomena (e.g. Aral et al. 2009, Bakshy et al. 2011, Bond et al. 2012), which limits our ability to infer how information and influence campaigns evolve and continue to shape discourse and social dynamics as they move from one network to another either voluntarily or involuntarily (e.g., because some group or topic is banned on a platform). Our work will contribute to the computational social science theories informing these processes and open new lines of inquiry on how information operations grow and change across time and cyberspace.

The building of models and metrics for defining, describing, and evaluating influence campaigns in the effort will utilize current research on social contagion theory (Macy, Cornell) and on information maneuver (Carley and Beskow 2019) to provide a beginning point for the scientific framework for this work. Social science research will be combined with information science research, (b) (4) ███████████████████████████████████
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████████████████████████ Machine learning, natural language processing, and statistical studies will

be combined with insights and frameworks from social science to develop new algorithms and causal models to detect, track, and analyze influence and threat content across multiple social media and traditional news media platforms.

Graphika's research will provide groundbreaking insights into the strategic landscape of disinformation flows, including both "negative" or "deconstructive" strategies, such as distort, dismiss, dismay, and distract ([Nimmo 2015](#)), and "positive" or "constructive" strategies, such as identifying "superspreaders" and "superfriends" ([Carley 2019](#)). Our research will not involve direct evaluation of specific counter-strategies or their causal impact on the spread of disinformation – such evaluations will require future, separate projects. At the same time, our research will provide valuable context and information about the causal mechanisms that allow disinformation campaigns to operate successfully, including information on possible strategies for countering cross-platform disinformation.

Project Description and Objectives

Graphika will deliver a basic research program focused on models and algorithms for network mappings that span multiple social media platforms, which can be further enhanced by AI-enabled algorithmic detection models. Graphika will research and subsequently develop a set of machine learning, natural language processing, statistical, and causal models to detect, track, and analyze influence and threat content across multiple social media and traditional news media platforms.

The program will be delivered over the course of 24 months and will focus on the following key research objectives:

1. **Research Objective 1:** Research multi-modal network mappings and perform an assessment on how these mappings can be subsequently leveraged for cross-platform detection of social contagion and coordinated activity to support automated indicators and warnings of malign campaigns.
2. **Research Objective 2:** (b) (4) ████████████████████████ ██ ██ ██████████████████████████
3. **Research Objective 3:** Research and assess the feasibility of developing new metrics to measure the impact of information operation (b) (4) ████████████████ ██ ████████████

At the conclusion of the 24 month program, a productization effort could be undertaken to integrate new technologies resulting from this research program into a fully featured software platform that would be deployable for USG customers with the mission of defending the United States against malign influence.

1.0 Research Objective 1: Multi-Modal Network Mapping and Cross-Platform Detection

As discussed above, each social media platform is unique in its framework and capability to detect, track, and take down online threat actors and malign narratives. To that end, it becomes extraordinarily complex to perform any level of detection or analysis in a cross-platform scenario.

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1.2 Extend Dynamic Language and Network Models to Incorporate Multiple Platforms

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The development and testing of these extended models require the following:

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nt ideas/topics, sentiment, political and moral values) over multiple online platforms.

These tools are optimal for cross-platform analyses. Similar influence and threat content often moves across multiple spaces of the Web at different rates and evolves in different ways as it spreads over these paths and through new people and contexts (e.g., from political news media to short posts in Twitter to long posts in Facebook to other websites), and network and language models can track these dynamics of interacting people and cultural objects (e.g., words, phrases, images, URLs) and how they change within and across different domains and platforms over time.

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1.3 Study the Feasibility of Automated Multi-Modal Cross-Platform Mapping

Upon completion of 1.1 and 1.2, Graphika will study the feasibility for multi-modal mapping using test data and potential map renderings against non-automated methods to assist in model validation and further experiments in Research Objectives 2 and 3.

1.3.1 Collect sample test data across a series of social media platforms.
1.3.2 Test and evaluate the feasibility of a cross platform mapping capability.
1.3.3 Develop a report on our findings and the potential impacts on the future of this capability.

2.0 Research Objective 2: (b) (4) [REDACTED] **and Automated Lead Detection**

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To establish a baseline for our (b) (4) and to develop/test a causal framework (see Objective 3), we will use publicly available data from Twitter on information operations involving foreign agents in the United Arab Emirates and Egypt, Saudi Arabia, Spain, Ecuador, China (PRC)/Hong Kong, and users from other nations.[1] With this ground-truth social media network and language data, we will also use finely detailed annotations of propaganda techniques in news articles (black-and-white fallacy, loaded language, exaggeration, name calling, minimization, etc.) publicly available[2] from the *SemEval 2020 Task 11* to detect such phenomena in other contexts using deep-learning language models ([Devlin et al. 2018](#), [Jurkiewicz et al. 2020](#)).

3.0 Research Objective 3: Leveraging Causal Inference to Measure the Impact of Online Campaigns and Identify Signals for Transitions to Offline Behaviors

Research Objectives 1 and 2 focus on the detection and attribution of malign influence campaigns. Once a threat has been detected, its potential impact must be assessed to determine whether mitigation is required and what type of response is warranted. Objective 3 will focus on researching how causal inference can be leveraged to establish new metrics in two distinct areas of impact measurement.

1. The likelihood of a cross-platform disinformation campaign to affect implicit information content generated by target audiences via mechanisms such as linguistic accommodation. (Objectives 3.1 and 3.2).
2. The likelihood of online cross-platform disinformation campaigns to transition to offline activity in the physical world, as measured through coverage in news media. (Objective 3.3)

3.1 Development of Models and Metrics to Measure Impact of Malign Influence Campaigns

Our research in this area will expand causal modeling to measure the effects of influence and threat content on groups of users, including the vulnerability of particular communities to specific influence and threat content flows, and how events on one social/news media platform affect users and content on other platforms ([Lukito 2019](#)).

Our usage of causal modeling requires the following steps:

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[1] [blog.twitter.com/en_us/topics/company/2019/info-ops-disclosure-data-september-2019 html](#).
[2] [propaganda.qcri.org/semeval2020-task11/](#).

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This framework will enhance our previously described analysis pipeline with advanced models of social influence dynamics in information operations ([Qiu et al. 2018](#), [Park et al. 2019](#))(b) (4) █████
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Project Management

The Graphika team includes expertise in federal contract and project management. Graphika will assign a project manager (PM) to communicate with the customer stakeholders as needed. The PM will prepare and deliver the monthly progress reports at the start of each month to include:

- A summary of the work performed, including an explanation of changes to the work planned in the previous month;
- Key issues or problems that may affect performance or schedule, along with the proposed corrective actions;
- Technical reports provided to the Government, and when and to whom provided.

Graphika will meet with the customer Program Manager (PM), Contracting Officer (CO), and Contracting Officer's Representative (COR) monthly, or as needed, to present deliverables, discuss progress, and resolve emerging problems. If necessary, Graphika has cleared personnel and is able to support any and all meetings at client spaces. After each meeting, Graphika will submit a meeting report recording all key minutes and subsequent actions within five working days. Graphika will submit each report electronically via email unless the PM, CO, or COR request otherwise.

Notional SOW Timing

MILESTONE DESCRIPTION	ESTIMATED TIMING
Kick-off meeting and finalize Sponsor requirements	Award + 1 month
Activate Graphika SaaS platform license to supply up to 5 social data feeds for cross-platform research.	Kickoff + 2 weeks
Research Objectives 1.1 and 1.2: Structural Analysis of Multimodal Mapping Research	Award + 6 months
Research Objective 1.3: Cross-Platform Mapping Research	Award + 9 months

Research Objective 2.1: IO Repository Creation	Award + 12 months
Research Objective 2.2: Fingerprinting Status Research	Award + 15 months
Research Objective 3.1: Causal Inference Research	Award + 18 months
Research Objective 3.2: Social to Physical Impact Research	Award + 22 months

Key Personnel

Name	Title	Role
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Research Bios

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Sponsor Responsibilities

Sponsor will facilitate the holding of up to 5 security clearances for Graphika personnel (Award + 1 month). Sponsor will also collaborate with Graphika to identify the highest priority data feeds to be utilized during Research Objective 1 (Award + 2 months).

Milestones & Invoicing

Estimated Invoice Date	Description	Amount	Category
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